

*On the Development of the Leaves of the Sarraceniæ.*

By M. H. BAILLON.

The exceptionally formed leaves borne by the *Sarraceniæ* are well known as regards their external configuration and the long horn-shaped bag which forms their principal part; the lid, of variable form, which surmounts, and even the sort of projecting ridge which extends throughout the length of their inner margin, have been well distinguished. But botanists are not agreed as to the interpretation of these different regions of the leaf. The most generally accepted opinion upon this point is that put forward by A. Saint-Hilaire and M. Duchartre, amongst others. The former (*Morphol. Végét.* p. 142) supposes the winged margins of the petiole of *Citrus hystrix* or of *Dionea* approximated and amalgamated, and says that we shall then have the leaf of *Sarracenia*, formed of an elongated urn (the true petiole) and a lid (the true leaf); and the second of these authors likewise says (*Elém. de Bot.* p. 308) that the ascidium of these plants is generally regarded as formed by the petiole, and their posterior lip or operculum as representing the limb.

Organogenetic observations alone could show how much of these interpretations was to be admitted. We have therefore studied the development of the leaves in *S. purpurea*, which is frequently cultivated in this country. In their earliest stage these leaves are represented by small mamillæ, the surface of which is at first convex. A little later the base of these organs becomes slightly dilated, and concave within: this is the first rudiment of the sheath, a portion of the leaf which, as we shall see, has nothing to do with the cavity of the pitcher of the *Sarracenia*. This vaginal portion, which will subsequently acquire a considerable development, behaves here in the same way as in all plants in which it exists, and has no influence upon the composition of the pitcher. The first indication of the latter is a small depression, a sort of pit, at first very slightly marked, which is produced at the top and a little on the inside of the cone which represents the young leaf. This depression is really due only to an inequality of development in the various portions of the apex of the leaf; and the inequality occurs rather late towards the apex of a leaf of which the petiolar and vaginal portions already exist. In this respect the leaves of the *Sarraceniæ* behave nearly like those of the *Nymphæacææ*, with which they have so many other analogies.

At this age the young leaves of the *Sarraceniæ* have the same appearance as those of *Nepenthes*, but for a very different reason, if we admit, with Dr. J. D. Hooker, that the pitchers of the latter are the result of the great development of a gland. Here it is certainly the upper surface of the limb that is at this period reduced to a pit; and this depression is lined with an epidermis which is the upper epidermis of the leaf, which is developed in proportion as the pit becomes larger, and which subsequently even becomes covered with hairs, the secreting faculty of which has been noticed by many observers. The more the pit becomes hollowed out, the more does the limb of the leaf acquire the appearance of certain peltate leaves,

such as those of *Nelumbo*, which is nearly allied to *Sarracenia*. The large and shallow cone which is formed by the limb of the leaf in *Nelumbo* becomes, in *Sarracenia*, deeper and narrower, so as finally to present the form of a long obconical cornet. Simultaneously with this change of form, the portion of the leaf which is called the lid becomes marked off, no doubt in a variable manner in the different species. We know that there are peltate leaves of which the margin of the limb is not entire, but cut into crenulations and lobes, and that sometimes these lobes are unequal, the terminal median one being perhaps more developed than the others. This is one of the causes of the petiole not being inserted in the centre of the peltate limb, but nearer to its base, which is most commonly more or less deeply emarginate-cordate. In the leaf of *Sarracenia* we might expect from the first to see an analogous phenomenon produced, because the pit is surrounded by a border which is thicker above than at the sides and below. This inequality only becomes more strongly marked with age; and it is the upper margin that increases most rapidly, afterwards becoming slightly constricted at its base. This is the origin of the lid and of the more or less distinct lateral projections which often accompany it; these are consequently not a limb, but the unequal lobes of a limb which existed before them.

The signification of that sort of vertical keel which runs along the inner border of the pitcher remains to be explained. This organ exists, usually in a rudimentary state, in a great number of peltate leaves. In these leaves we often observe a nervure or projecting crest, which stretches, on the lower surface of the limb, from the insertion of the petiole to the bottom of the sinus presented by the base of the limb. The crest of the leaves of *Sarracenia* appears to us to be nothing but an exaggeration of this very part; and its vertical direction is merely the consequence of the extreme depth acquired by the immoderately peltate limb of the leaf of *Sarracenia*.—*Comptes Rendus*, Nov. 7, 1870, p. 630.

*Note on the Malar Bone in the Skulls of Manidæ.*

By Dr. J. E. GRAY, F.R.S. &c.

The skulls of *Manis* which have been described and figured, and all the specimens that I have hitherto seen in different museums, have a very imperfect zygomatic arch, caused by the absence of the malar bone. Indeed Mr. Flower, in his admirable 'Introduction to the Osteology of the Mammalia' (p. 206), describing the skull of *Manis*, observes:—"There is no distinction between the orbit and the temporal fossa, which forms a small oval depression near the middle of the side of the skull. There are short zygomatic processes on the maxilla and squamosal, owing to the absence of the malar."

Mr. Swinhoe, early last year, brought me for examination some skulls of *Manis* from Amoy and Formosa, along with the skulls of a new deer and hare. I observed that some of the skulls of *Manis*